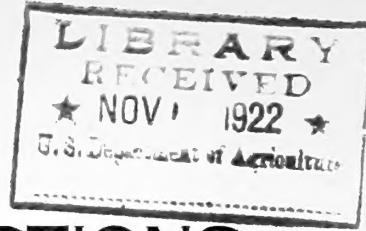


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# PLANT INTRODUCTIONS

## ELEVENTH ANNUAL LIST

### 1922-1923

CONTAINING DESCRIPTIONS OF THE MORE IMPORTANT  
INTRODUCED PLANTS NOW READY  
FOR EXPERIMENTERS.

NOTE: Since the Federal Horticultural Board inspection is made at the time the plants are dug preparatory to their being sent out, it may be necessary to withhold some of the plants herein listed because of quarantine regulations.

OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION

BUREAU OF PLANT INDUSTRY

UNITED STATES DEPARTMENT OF AGRICULTURE

OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION  
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## PLANT INTRODUCTIONS

Experimenters are particularly requested to read this  
Introductory Note

THIS LIST describes many species and varieties of newly introduced foreign plants which have not been widely tested in this country. Our knowledge of them, consequently, is very limited and we cannot predict their behavior with any degree of certainty.

These plants have been imported because of some direct or indirect use which it is thought can be made of them. They are first placed at the disposal of Experimenters of the United States Department of Agriculture and the State Experiment Stations of the country, but many of them will be available to such private experimenters as have the necessary facilities and desire to test them. Since these plants must be grown by private individuals before their commercial value is determined, experimenters who test them are assisting in a very practical way in the plant introduction work of the country. A new plant industry often arises through the success of some private individual who proves that an introduced plant will grow in his region and finds a use for its product.

The List is sent to those who have qualified as Experimenters with the Office of Foreign Seed and Plant Introduction and have indicated their willingness to receive and care for the material sent to them for experimental planting in their region. The number of plants that can be propagated from an introduction is usually limited and as it is desired to test each species over as wide a range as possible in order to determine its adaptability to soil and climatic conditions, each Experimenter is usually sent a single plant under any one introduction number, and often, because of the small number of plants available, it is found impossible to send him any of the particular kinds for which he asks.

These plants are placed in the hands of Experimenters **with the understanding that they will be given unusual attention**, and that the Experimenter will report to this Office on their behavior and their apparent value in his community. Not only have these Introduced Plants cost a great deal of money, but they also have involved, in many cases, dangers and hardships to our Agricultural Explorers sent out to find them. Nothing is more disheartening to the man who has risked his life in obtaining some new and valuable plant than to find on his return to America that the Experimenter to whom the plant was sent did not care enough for it even to keep the label attached to the plant or to prevent its being choked by weeds.

While to the Experimenter some of these plants may seem to be of little value, final judgment upon them should be reserved until they have been given a thorough trial. Even to know that an introduced

plant will grow in a certain locality is often of distinct value.

The special labels which are attached to the plants sent out give a brief description of their uses. The number on the label is the Seed and Plant Introduction (S. P. I.) number and corresponds to the number of a published description of the plant. Since reports may be requested from Experimenters at any time, or a representative of this Office may call to inspect their plantings, **it is important either that the label be kept with the plants, or that a plot be made of the planting in order that the location of the plants may be known at all times.**

Accompanying this catalogue are complete check lists of all seeds and plants ready for distribution at the Introduction Gardens during the season 1922-23. Applicants for plants or seeds should fill out all blanks on the first sheet accompanying the check lists, place a check mark to the left of the S.P.I. number of each plant desired, and **return the lists promptly to this Office.** The final judgment, however, as to whether a plant should be sent to a certain region must be left to the officials of this Office. Plants will not be sent to a region thought to be unsuited to them.

Requests are acted upon in the order of the receipt of the returned checked lists, and the plants requested are reserved for the Experimenter to be sent to him at the time designated by him if it is possible to do so. The **shipping season** as a rule **extends from December 1st to April 15th.**

All seeds and plants imported by this Office are examined upon their arrival by the Federal Horticultural Board, and the plants grown from these original importations are further inspected before they are sent out. Every effort is made to insure the distribution of only such plants as are healthy and are free from injurious plant diseases or insect pests.

*DAVID FAIRCHILD,*

Agricultural Explorer in Charge.

## DESCRIPTIVE LIST.

**52800. ACACIA PENDULA.** From Sydney, New South Wales. Seeds presented by George Valder, Director of Agriculture. This acacia, known among stockmen as Myall and Weeping Myall, is a handsome evergreen tree sometimes reaching 35 feet in height. The silver-gray phyllodia, or apparent leaves, rich in nourishment, are eagerly devoured by sheep and cattle; in arid countries this tree might become an important source of forage. The wood, which is well adapted for veneering, is heavy, close grained, and of a rich dark-brown color, beautifully marked, and having the odor of violets.

**54439. ACACIA PYCNANTHA.** Golden Wattle. From Tangier, Morocco. Seeds presented by J. Goffart. A small, rapid-growing tree with leathery phyllodia (apparent leaves) and masses of fragrant yellow flowers. This species has many uses: it is second only to *Acacia mollissima* in its yield of tanbark; from the flowers a perfume is distilled; the gum which exudes from the trunk is utilized in cotton printing.

**54799. ACACIA VEREK.** From Anglo-Egyptian Sudan. Seeds presented by Maj. R. G. Archibald, Wellcome Tropical Research Laboratories. A small tree which thrives in semiarid climates where heavy frosts are not experienced. It yields the true gum arabic of commerce. A species suggested for trial in mild-wintered portions of the southwestern United States.

**48551. ACTINIDIA sp.** From China. Seeds collected by J. B. Norton, Agricultural Explorer. A remarkably vigorous-growing, ornamental, woody climber suitable for porches and arbors. When cut back the plant develops shoots 20 feet or more in length before laterals appear. The young woolly shoots are strikingly attractive. The fruits are edible, but not of commercial value.

**54460. ACTINIDIA CHINENSIS.** Original introduction from China. Seed presented by Bruce Drummond, Indio, Calif. The Chinese actinidia, or yang tao, is an ornamental deciduous climber, native to Szechwan Province, China. This plant has attracted considerable attention because of its edible fruits. These may be eaten from the vine, served with sugar and cream, or used for jams and sauces. They are russet-brown, hairy, about 2 inches long, and have greenish flesh of pleasant flavor, resembling that of gooseberries but tempered with a taste peculiarly its own. As much as a bushel of fruits has been borne on a single vine. The leaves have a plushlike texture and an unusual dark-green color, and their large size and regular spacing add to the beauty of the vine. The flowers are buff-yellow to white, fragrant, about an inch broad, and are produced in great abundance.

**42683. ACTINIDIA CORIACEA.** From central China. Seeds received from Vilmorin-Andrieux & Co., Paris. A strong-growing, woody vine useful for covering arbors, pergolas, and for training over porches. It has large, leathery leaves, clusters of red or rarely yellow, some-

times white-margined flowers, and small, spotted berries. Its cultivation is advised only in mild-wintered regions.

52307. **AGATI GRANDIFLORA.** From Colombia. Seeds collected by Wilson Popenoe, Agricultural Explorer. A beautiful flowering tree of the Tropics, perhaps suited to cultivation in southern Florida. It attains about 30 feet in height, is of erect, slender habit, has graceful pinnate foliage, and bears large white flowers which suggest sweet peas. It is a point in favor of this tree that when only 4 or 5 feet high it begins to show its first blossoms.

49746. **ALBIZZIA** sp. From Guatemala. Seeds collected by Wilson Popenoe, Agricultural Explorer. A medium-sized tropical tree related to the so-called mimosa which is cultivated in our Southern States. It has graceful pinnate leaves and bears a profusion of small yellow flowers. This notable ornamental should be tried in Florida and California.

51143. **ALBIZZIA CHINENSIS.** Seeds presented by Dr. A. Robertson Proschowsky, Nice, France. An attractive flowering tree, native to tropical Asia; the wood is used for cart wheels, cabinet work, furniture, tea boxes, and fuel. The foliage is valued as forage, and a gum suitable for sizing paper is exuded from the trunk. For trial in Florida and mild-wintered portions of the Southwest.

54738. **ALEURITES FORDII.** From China. Seeds presented by Albert R. Arey, Pineville, La. The tung oil tree, a native of China, is a handsome ornamental. It bears a profusion of pinkish white flowers in the spring just as the leaves, similar to those of catalpa, begin to appear. The seeds (not edible) yield the tung oil, or Chinese wood-oil, now imported from China and used extensively for the manufacture of paint, varnish, and linoleum, and for many other purposes. When produced in sufficient quantities there will doubtless be a market for the seed. A deep sand-clay loam is preferred by this tree, but it will also grow in other well-drained soils that produce ordinary crops. From a tree grown from seed introduced in 1907 under S.P. I. No. 21013.

54727. **AMPELOCISSUS IMPERIALIS.** From Buitenzorg, Java. Seeds presented by Dr. W. M. Docters van Leeuwen, director, Botanic Garden. An ornamental vine from tropical and subtropical Asia, related to the grape, with thick, heart-shaped leaves resembling those of a begonia, and long-stalked clusters of deep-violet flowers. The small, spherical, 2-seeded berries are sour but good for jelly. For testing only in southern Florida and southern California.

39434. **AMPELOPSIS ACONITIFOLIA.** From Pingyanfu, Shansi, China. Seeds collected by Frank N. Meyer, Agricultural Explorer. This is a handsome vine related to the Virginia creeper, with cut-toothed leaves and yellow berries. It is valued as a porch and pergola vine on account of its rapid growth and comparative hardiness.

**33215. AMYGDALUS COMMUNIS.** Malaguena Almond. From Granada, Spain. Introduced by Dr. Walter T. Swingle, of this Department. This is one of the famous Jordan almonds, of which large quantities are exported from Spain to the United States. Dr. Swingle states that it withstands arid conditions and succeeds best on warm limestone soils. For trial in the almond-growing regions of the Pacific coast.

**33217. AMYGDALUS COMMUNIS.** Almond. From Granada, Spain. Received through Dr. Walter T. Swingle, of this Department. A large, early, hard-shelled variety, highly recommended by Spanish growers.

**33218. AMYGDALUS COMMUNIS.** Del Desmayo Almond. Introduced from Spain by Dr. Walter T. Swingle, of this Department. This variety is said to be somewhat more cold-resistant than other varieties because of the peculiar attachment of the flowers, which are turned downward so that the corolla protects them from light frosts and permits the development of fruits when the flowers of other varieties are nipped.

**24807. AMYGDALUS PERSICA.** Peach. Original introduction from Tashkent, Turkestan. Seeds collected by Prof. N. E. Hansen, Agricultural Explorer. Budded plants are available from a selected seedling. This variety produces a small, white, freestone peach with delicate, white, melting, juicy, highly flavored fruits, too small to be valuable commercially but excellent for home use.

**32374. AMYGDALUS PERSICA.** Mexican Seedling Peach. Selected at the Government Experimental Farm, San Antonio, Texas, from plants grown from seed introduced by Onderdonk. A large, yellow, clingstone peach of pleasant subacid flavor, ripening at the San Antonio Station about the first of September. As it is a good shipper, it may prove to be a fruit of commercial value.

**33219. AMYGDALUS PERSICA.** Vainqueur Peach. From Granada, Spain. Scions imported by Dr. Walter T. Swingle, of this Department. A medium-sized, very early ripening peach having white skin flushed with red, and white, soft, juicy flesh of good flavor; the pit is pink. While not a good shipper, this variety is an excellent one for home use and near-by markets.

**35201. AMYGDALUS PERSICA.** Peach. Original introduction from Mengtsze, Yunnan, China. Seeds presented by the Commissioner of Customs. Budded plants are available from a selected seedling. The fruit of this variety is a fine golden cling with pure yellow flesh. The pit is flattened, not marking the flesh, which is very firm and of good quality. This peach should prove excellent for commercial canning.

**36125. AMYGDALUS PERSICA.** Sutter Creek Peach. Grown at the Plant Introduction Garden, Chico, Calif. A clingstone variety of large size and good quality, ripening a little later than the well-known Elberta which it resembles. It is of interest to breeders and commercial growers that this variety shows resistance to the peach leaf-curl.

41395. **AMYGDALUS PERSICA.** Dwarf Peach. From Kiayingchau, Kwang-tung, China. Seeds presented by George Campbell. A Chinese ornamental, grown in pots as a house plant. Mr. Campbell reports one tree, 15 inches high with a stem no larger than a lead pencil, which bore 5 full-sized, white-fleshed, clingstone peaches of good quality. The blossoms are showy, and the prettily colored fruits hang on the trees for a long time. Buds from original seedlings. This variety has not yet fruited in America.

43124. **AMYGDALUS PERSICA.** Peach. Variety A 1. From New Zealand. Plants presented by H. R. Wright, who describes the fruit as an ideal market peach which yields heavily every year. The growth is short, thick, and compact; the foliage very large and handsome.

43127. **AMYGDALUS PERSICA.** Peach. Variety Ideal. From New Zealand. Plants presented by H. R. Wright. This variety is medium early, with fruits of good size having firm, golden yellow flesh of fine flavor and good quality.

43129. **AMYGDALUS PERSICA.** Peach. Variety Late Champion. From New Zealand. Plants presented by H. R. Wright. The fruits of this variety are large, bright yellow with a red blush; the flesh is yellow, juicy, and of good flavor. It is one of the best of late freestone peaches, a fair shipper, a good drier, and of good quality for canning.

43130. **AMYGDALUS PERSICA.** Peach. Variety Lippiatt's Late Red. From New Zealand. Plants presented by H. R. Wright. A medium-sized clingstone peach having yellow skin overspread with a red blush. The flesh is firm with a red pit. The flavor is very good. This peach is of value for table use and home canning.

43132. **AMYGDALUS PERSICA.** Peach. Variety Motion's Cling. From New Zealand. Plants presented by H. R. Wright. This is a large clingstone peach resembling the Stark in appearance. The fruits are richly colored and of good quality. It is said to be an ideal market peach and one which yields heavily.

43133. **AMYGDALUS PERSICA.** Peach. Variety Muir's Perfection. From New Zealand. Plants presented by H. R. Wright. A fine mid-season peach of large size and excellent flavor. The flesh is white, freestone, and of excellent quality. It has proved valuable for commercial and home use in New Zealand and deserves a trial in this country.

43135. **AMYGDALUS PERSICA.** Peach. Variety Paragon. From New Zealand. Plants presented by H. R. Wright. This is a standard and dependable New Zealand clingstone peach with yellow flesh of good quality. It is recommended as a dependable bearer.

43136. **AMYGDALUS PERSICA.** Peach. Variety Shipper Cling. From New Zealand. Plants presented by H. R. Wright. A very large cling-

stone peach of attractive appearance and splendid quality. The skin is orange yellow with a red blush, the flesh yellow, of excellent flavor. It is recommended by Mr. Wright as of unusual merit for canning, as the fruit retains its form when cooked.

**43137. AMYGDALUS PERSICA.** Peach. Variety Up-to-date. From New Zealand. Plants presented by H. R. Wright. Described as a vigorous-growing, heavy-yielding variety producing very large freestone, yellow-fleshed fruits of excellent quality. The fruits are too delicate in texture to withstand shipment to distant markets, but for canning and home use it is said to be excellent.

**43289. AMYGDALUS PERSICA.** Peach. Original introduction from Canton, China. Seeds presented by P. R. Josselyn, American vice consul. Budded plants available from a selected seedling of the Ying Tsui To (eagle's beak peach). This is a small, white, freestone peach with sweet, white flesh and a red pit. Of value for home use.

**43291. AMYGDALUS PERSICA.** Peach. Original introduction from Canton, China. Seeds presented by P. R. Josselyn, American vice consul. Budded plants available from a selected seedling whose fruits are small, white, freestone, with exceedingly sweet flesh. It is a good variety for eating from the tree, but of little value commercially.

**48508. AMYGDALUS PERSICA.** Indian Blood Peach. From Santa Cruz, Calif. Seeds presented by George G. Streator. A variety of vigorous growth, yielding medium-sized, greenish gray and red fruits having blood-red, very juicy flesh of excellent quality. The season of ripening is late. This variety is promising as a canning peach.

**55563. AMYGDALUS PERSICA.** Peach. Plants budded from a seedling grown and selected at the Plant Introduction Garden, Chico, California, from seed obtained through John R. Putnam, American consul at Valencia, Spain. The fruits of this variety are large and yellow with a red blush. The flesh is golden yellow throughout and of excellent flavor; the pit is small. The fruits weigh, on the average, 9 ounces. This variety promises to be of value as a commercial canning peach. It remains firm when cooked, maintains its delicate flavor, and does not require a very heavy sirup. The fruits ripen at the Chico Plant Introduction Garden about August 20.

**55564. AMYGDALUS PERSICA.** Peach. Plants budded from a selected seedling. Grown and selected at the Plant Introduction Garden at Chico, Calif., from seed obtained through John R. Putnam, American consul at Valencia, Spain. The fruits are a fine golden yellow, blushed red, with a deep basin and distinct suture. The pit is small and yellow, not coloring the flesh, which is firm and of fine flavor. It is a good shipper and may prove excellent for canning. The average weight of the fruits is about 5 ounces. The variety ripens at the Chico Garden about the middle of August.

11777. **AMYGDALUS PERSICA NECTARINA.** Crosby Nectarine. Original introduction from Kashgar, Kashmir, British India. Seeds presented by Rev. P. J. P. Hendriks. Budded plants available from selected seedling. The fruits of this variety are rather small and freestone, dark red, deliciously flavored, and stand shipping very well.

26503. **AMYGDALUS PERSICA NECTARINA.** Nectarine. Original introduction from Chinese Turkestan. Seeds presented by E. Coates. Budded plants available from a selected seedling. The fruits are large, freestone, creamy yellow with a red blush. The flesh is creamy white, red at the stone, juicy, crisp, subacid, and of very good quality. The fruit keeps well in shipment.

29227. **AMYGDALUS PERSICA NECTARINA.** Nectarine. Original introduction from Samarkand, Russian Turkestan. Seeds collected by Frank N. Meyer, Agricultural Explorer. Budded plants are available from a selected seedling whose fruits are waxy yellow and of good flavor, but too small to be of commercial value.

30648. **AMYGDALUS PERSICA NECTARINA.** Nectarine. Original introduction from Guma, Sinkiang, China. Seeds collected by Frank N. Meyer, Agricultural Explorer. Budded plants are available from a selected seedling. This is a medium-sized, freestone nectarine of good flavor and quality, with red pit.

34685. **AMYGDALUS PERSICA NECTARINA.** Quetta Nectarine. Original introduction from Quetta, British India. Seeds presented by Lieut. W. L. Maxwell. Plants budded from a selected seedling. A nectarine of splendid size and appearance. The skin is green, heavily blotched with red; the flesh is greenish, red near the pit, juicy, and of excellent flavor; the pit is large and red. One of the finest nectarines grown, and a good shipper. In the United States it has produced fruit which has been praised by all who have sampled it.

43139. **AMYGDALUS PERSICA NECTARINA.** Nectarine. Variety Ansenne. From New Zealand. Plants presented by H. R. Wright. The fruits are large, red, freestone, of splendid appearance, and excellent flavor and quality. This variety bears freely and seems worthy of extended trial.

43140. **AMYGDALUS PERSICA NECTARINA.** Nectarine. Variety Diamond Jubilee. From New Zealand. Plants presented by H. R. Wright. Fruits of this variety are very large, freestone, with highly colored, melting, juicy, sweet flesh of excellent flavor.

43141. **AMYGDALUS PERSICA NECTARINA.** Nectarine. Variety Gold Mine. From New Zealand. Plants presented by H. R. Wright. A fine large freestone nectarine of red and yellow color. The flesh is cream-white, delicately flavored, and of excellent quality.

43142. **AMYGDALUS PERSICA NECTARINA.** Nectarine. Variety Lippiatt's Late Orange. From New Zealand. Plants presented by H. R.

Wright. The fruits of this variety are very large and handsomely colored, being orange and dark red. The flesh is juicy, with excellent, distinctive flavor.

**43143. AMYGDALUS PERSICA NECTARINA.** Nectarine. Variety Muir's Seedling. From New Zealand. Plants presented by H. R. Wright. A very large freestone nectarine of handsome appearance and excellent quality. The flesh is slightly pink at the pit, juicy, and of unusually fine flavor.

**43144. AMYGDALUS PERSICA NECTARINA.** Nectarine. Variety New Boy. From New Zealand. Plants presented by H. R. Wright. The fruits are of medium size, green, mottled with red; the flesh is red near the pit, and of fair quality. A very productive variety.

**43146. AMYGDALUS PERSICA NECTARINA.** Nectarine. Variety Sure-crop. From New Zealand. Plants presented by H. R. Wright. A productive sort, yielding medium-sized green fruits mottled with red. The flesh is of fair quality with a mild flavor.

**41709. AMYGDALUS TANGUTICA.** Tangutican Almond. From Taochow, Old City, Kansu, China. Seeds received from Rev. C. F. Snyder at the request of Frank N. Meyer, Agricultural Explorer. A variable species of bush almond producing bitter kernels. The plants sucker very extensively. The species is very hardy and drought resistant and is for this reason suggested for use in breeding experiments.

**54663. ANANAS SATIVUS.** Pineapple. From Limon, Costa Rica. Slips presented by G. P. Chittenden, Manager, United Fruit Co. This variety, called locally Chocoana, is cultivated on the island of Taboga, whence the fruit is shipped to Panama City, Colon, and the Canal Zone. The fruits are yellowish green externally, weighing 2 to 3 pounds. The white juicy flesh is sweet and of delicate flavor. Though probably not well adapted for canning, it is excellent for dessert use.

**51404. ANNONA DIVERSIFOLIA.** Ilama. From Guatemala. Seeds forwarded by H. W. Goforth, American consul, at the request of Wilson Popenoe, Agricultural Explorer. The ilama, indigenous in the mountains and foothills of southwestern Mexico, Guatemala, and Salvador, is one of the finest annonaceous fruits which can be grown in the tropical lowlands. The fruit is conical, oval or round in form, the largest specimens weighing about  $1\frac{1}{2}$  pounds. The edible pulp is cream-colored or rose-tinted, and incloses the hard, smooth, nutlike seeds. The flavor is sweet, resembling that of the sugar apple and the cherimoya, or is, in some varieties, mildly acidulous. Introduced for trial in southern Florida and southern California.

**26565. ARALIA CORDATA.** Udo. From Japan. A spring salad vegetable, very popular in Japan, which, when properly grown and suitably prepared for the table, is of great delicacy. The young shoots are blanched by mounding with earth or by covering with closed drain tiles in the early spring. In Nova Scotia these are available two weeks

before asparagus. The shoots are sliced, chilled in ice water, and served with French dressing, or are cooked and served like asparagus. They have a delicate and delicious piney flavor if the blanching has been thorough. The plants, which continue to yield for about 9 years, are set 3 or 4 feet apart and in summer make an attractive screen of foliage 4 to 6 feet high which dies down in the fall. Udo is certain to grow in favor in this country as soon as the correct methods of culture and preparation are generally understood. Special directions will be furnished on application.

**49891. ATALAYA HEMIGLAUCA.** From Sydney, New South Wales. Seeds presented by the Forestry Commission of New South Wales. This tree, called "Whitewood" because of the color of its foliage and "Cattle Bush" because it was widely used for forage in the early days in Australia, attains a height of 30 feet and has large, whitish leaves. When grass and other herbage fail, the leaves are fed to cattle, the trees sometimes being cut down for this purpose. The wood is yellowish, close grained, and tough. It recommends itself for use in the Southwestern States, particularly in view of its value as a forage crop in semiarid countries.

**54988. BARYXYLUM AFRICANUM.** From Matania El Saff, Egypt. Seeds presented by A. Bircher. A handsome evergreen tree of the legume family, 20 to 25 feet in height, with feathery leaves and attractive saffron-yellow flowers. This tree should prove suitable for ornamental planting in southern Florida.

**9662. BIGNONIA CHAMBERLAYNII.** From Funchal, Madeira. Received through Barbour Lathrop and David Fairchild. A beautiful tropical climber, allied to the trumpet creeper, which produces clusters of tubular, bright-yellow flowers. The vine is suitable for walls and trellises in southern California and southern Florida.

**51503. CALLISTEMON sp.** From Kenya Colony, Africa. Seeds collected by Dr. H. L. Shantz, Agricultural Explorer. A handsome ornamental flowering tree of the myrtle family, common in some of the central African provinces. The showy clusters, resembling bottle brushes, render the tree very attractive when in flower. The common name for this genus, "bottle brush" is derived from the resemblance of the flowers of the various species to bottle brushes. For trial in California and Florida.

**51283. CALLITRIS DRUMMONDII.** From Blackwood, South Australia. Seeds presented by Edwin Ashby. A dwarf, bright-green, ornamental, cypresslike tree of dome-shaped growth, which seems adapted to regions of little rainfall.

**46313. CANNA EDULIS.** Queensland Arrowroot. Tubers presented by J. M. Westgate, Hawaii Agricultural Experiment Station. A vigorous herbaceous perennial, resembling in appearance the ornamental canna or Indian shot. It is much cultivated in certain subtropical regions as a food plant, and for the starch which is obtained from its edible

tubers. During the year 1916, 660,000 pounds of this starch were produced from about 3,000 tons of tubers. In the Andes of South America the tubers are eaten by the Indians in much the same way as the potato is used in the United States. The plant lends itself to cultivation as an annual in the southern United States, young tubers being planted in the spring, and the crop harvested in the fall. Rich soil and abundant moisture are favorable to the successful culture of this species.

**54043. CARISSA CARANDAS.** From Poona, Bombay, India. A large, spiny, ornamental, evergreen shrub with elliptic, leathery, shining leaves and clusters of white, funnel-shaped flowers half an inch long, followed by purplish black, edible fruits which may be eaten either from the tree or made into excellent jelly, pickles, and preserves. The plant does well in certain parts of southern Florida and southern California.

**54530. CARYOPHYLLUS MALACCENSIS.** Ohia or Malay-apple. From Panama. Seeds collected by Dr. David Fairchild, Agricultural Explorer. This handsome tree, native to tropical Asia and a relative of the clove, deserves much wider cultivation in tropical America than it enjoys at present. It makes an erect, slender, pyramidal tree with large, dark-green, shining leaves, and produces in great abundance large, rose-red flowers, whose showiness is due to a long cluster of stamens. Most of these flowers are produced on the larger branches and are only visible when one is standing directly under the tree, at which time they appear to form a fairy haze of enchanting loveliness. The fruit is not of great value, but is used for preserves in the Asiatic tropics; it is sometimes 2 inches long, white to rose colored, with crisp, acidulous flesh, and 1 or 2 large seeds loose in a hollow cavity. It is suitable for cultivation only in lower Florida and tropical America.

**54923. CASSIA NODOSA.** Pink-and-white Shower. From Hawaii. Seeds presented by Dr. H. L. Lyon. This magnificent flowering tree is much used for street and ornamental planting in Honolulu, and elsewhere in the Tropics. It is a moderate-sized, deciduous tree with long drooping branches and glossy leaves. During May and June it bears a profusion of beautiful, bright pink and white, rose-scented flowers in dense clusters. This tree is native in India and the Philippines; in this country it would succeed only in extreme southern Florida, in Cuba, or others of the West Indian Group.

**54463. CASSIA SIAMEA.** From Honolulu, Hawaii. Seeds presented by Dr. H. L. Lyon. A medium-sized or large tree with grayish bark, graceful pinnate leaves, and large clusters of small, yellow flowers. The tree is valued as an ornamental and for its hard, heavy, durable timber, which is used for mallets, tool handles, walking sticks, for building purposes, and for fuel.

**55026. CASSIA TIMORIENSIS.** From Los Banos, Philippine Islands. Seeds presented by J. E. Higgins, Philippine College of Agriculture. A

handsome small evergreen tree with slender downy branches, pale green leaves, and bright yellow flowers. It is distributed throughout Malaysia and the Philippines, where it is valued as an ornamental and for its nearly black wood which is used in furniture making and for building purposes.

**52387. CASTANEA DIVERSIFOLIA.** Chestnut. From Bangkok, Siam. Seeds collected by J. F. Rock, Agricultural Explorer. A tree reaching a height of 60 feet, common in the drier forests of Martaban, Burma, at altitudes of 3,500 to 5,000 feet, and in the pine lands in northern Siam at altitudes of 4,000 to 5,000 feet. The thin-shelled nuts are about an inch in diameter. This species should be tested on the pine lands of Florida as well as in the American tropics.

**49720. CASUARINA CUNNINGHAMIANA.** Native to New South Wales and New Zealand. Seeds presented by William Hertrich, Huntington Estate, San Gabriel, Calif. This species is considered by many people to be more handsome than its congener *C. equisetifolia*, the well-known Australian pine. The cones are smaller than those of the last named, and the branches slender and graceful in appearance. The limited plantings of this species which have been made in the Southern States show that it is well adapted to cultivation in that region, where it has proved much hardier than *C. equisetifolia*.

**52909. CATALPA BUNGEI.** From Nanking, Kiangsu, China. Seeds presented by J. L. Buck. A valuable, rapid-growing Chinese tree, sometimes reaching 100 feet in height, with a trunk 10 to 15 feet in circumference. The wood, which is strong, light, durable, and nonwarping, resembles walnut in character and is much used in the manufacture of fine furniture. The tree prefers a porous soil and is easily propagated from suckers. It should not be confused with the *Catalpa bungei* of North American nurseries, which is a trade name of *C. bignonioides*.

**38836. CELASTRUS ANGULATUS.** Bittersweet. From Tahuashan, Shansi, China. Seeds collected by Frank N. Meyer, Agricultural Explorer. This is a species of bittersweet of semitrailing, shrubby habit, adapted for growing in shady places. When covered with its masses of yellow fruits out of which peep the scarlet-orange-coated seeds, it is a strikingly ornamental vine.

**49373. CHAMAEDOREA sp.** Pacayito. From Tucuru, Alta Verapaz, Guatemala. Plants collected by Wilson Popenoe, Agricultural Explorer. A handsome dwarf palm of much value for house culture. It has finely pinnate foliage, and rarely attains a height greater than 30 inches. When still quite small and growing in a 4 or 5-inch pot, it flowers and produces diminutive clusters of round fruits which add to its interest and decorative value. It needs abundant soil moisture, and a shaded corner of the room, since it comes from the dense forests of northern Guatemala where the rainfall is very heavy.

**CHAYOTA EDULIS.** Chayote. From Mexico, Central America, and the West Indies. A vigorous-growing, perennial-rooted vine, suited to

the Southern States. The plant yields enormous crops of fruits that keep well and are more delicately flavored than the squash. The freedom from fiber, the fine texture, and the ease of its preparation for cooking render the chayote adaptable for use in a variety of delicious dishes. The fruits may be fried, creamed, stuffed, served in stews, baked with meats, pickled, or preserved. Special directions for growing and cooking will be forwarded on request.

**15395. COLOCASIA ESCULENTA.** Trinidad Dasheen. From Trinidad, West Indies. A variety of the taro which constitutes a valuable root crop for the South. The plant, related to the elephant-ear, which it resembles closely in general appearance, produces large edible corms and medium-sized edible tubers which are used like potatoes. When properly prepared and eaten hot, they have an attractive nutty flavor, suggesting roasted chestnuts. The corms and tubers, when cooked, are drier and mealier than potatoes, and are found by chemical analysis to contain a greater percentage of protein and starch than does the potato. The young leaves make delicious greens, but when raw they are very acrid (like the Indian-turnip) and must first be parboiled with baking soda to remove the acridity. A rich loamy soil and a growing season of 7 to 8 months are required to mature a crop of dasheens. Special directions for growing and cooking will be furnished on application.

**44589. CORNUS CAPITATA.** Dogwood. From Siena, Italy. Seeds presented by Dr. Agilulfus Preda. A highly ornamental, deciduous, or partially evergreen small tree of bushy habit, native to the Himalayas and China. As in our flowering dogwood, the apparent petals are really large, showy, cream-white or yellow bracts 2 inches long, subtending the inconspicuous flowers. Before falling, the bracts turn ruddy. The fruit is a fleshy, strawberry-shaped crimson head a little more than an inch wide; edible, but not very tasty. It should be grown in mild-wintered regions.

**51780. CORYLUS COLURNA.** Turkish Hazel. Seeds presented by John Dunbar, Assistant Superintendent of Parks, Rochester, N. Y. A vigorous tree, native to southeastern Europe and Asia Minor, reaching 60 feet in height, and having a stout trunk and glossy leaves. The edible nuts, which are produced in clusters of 3 or 4, are small and hard shelled. The tree, which is of ornamental value because of its pyramidal form and attractive foliage, thrives in the climate of eastern Europe, where the summers are hot and the winters rather cold.

**54075. COTONEASTER DIELSIANA.** Originally from Western China. Seeds collected at the Arnold Arboretum. An ornamental shrub attaining 6 feet in height with slender arching branches, firm, oval leaves, and pinkish flowers in small clusters, followed by attractive small red fruits.

**38760. COTONEASTER FRIGIDA.** From the Himalayan slopes of northern India, at altitudes of 7,000 to 10,000 feet. A very strong-growing species with large leaves. The very numerous white flowers are

followed by a profusion of strikingly attractive bright-red berries. This shrub has proved a very desirable ornamental and will doubtless be grown more extensively in this country. It is propagated from seed, by layering, or from cuttings.

**32935. COTONEASTER MICROPHYLLA THYMIFOLIA.** Fire Thorn. From the Himalayas of northern India. Seeds presented by Prof. Alwin Berger, La Mortola Botanic Garden, Ventimiglia, Italy. A dwarf, prostrate or trailing shrub with persistent leaves, pinkish white flowers, and bright-red fruits. This is an attractive small plant, suitable for rockeries.

**52608. DELOSTOMA ROSEUM.** Cholan. From Ambato, Ecuador. Seeds collected by Wilson Popenoe, Agricultural Explorer. A small, somewhat spreading tree of southern Ecuador, where it grows in the Andes at elevations of 6,000 to 10,000 feet. It is shapely and attractive in appearance, and produces at the ends of the branchlets small clusters of dark lilac flowers resembling in form and appearance those of the trumpet vine. As it is not very frost-resistant, it is probably suitable for cultivation only in California and Florida.

**52609. DELOSTOMA ROSEUM.** From Ambato, Ecuador. Seeds collected by Wilson Popenoe, Agricultural Explorer. Like the preceding except that the flowers are of a pale shade of lilac.

**53610. DENDROCALAMUS STRICTUS.** Bamboo. From Dehra Dun, India. Seeds presented by R. S. Hole, Forest Botanist. The culms of this rapid-growing bamboo are usually solid and in India sometimes grow to a height of 70 feet; they are curved near the tips, giving them a highly ornamental, plumelike effect. The species is reported to be resistant to light frosts. It is a clump bamboo, and in consequence spreads very slowly. The strong, durable timber is highly valued for building and other purposes.

**37943. DIOSCOREA ALATA.** Greater, or Ten-months' Yam. A West Indian variety of the true yam, cultivated sparingly in Florida. It is not related to the sweet potato, some varieties of which are called yams. The tubers of this plant, which sometimes reach a weight of 10 pounds or more each, are white-fleshed, and in composition are similar to the white potato, from which they can scarcely be distinguished when properly cooked. Yam tubers, when properly handled, may be stored over a long period without appreciable deterioration. For cultivation a deep mellow soil and a growing season of 9 to 10 months are required, but the plant is a handsome vine and may be grown for porch decoration where the season is much shorter. This yam deserves much wider cultivation in Florida for home use and for markets.

**39705. DIOSCOREA ALATA.** Guam Yam, or Dago Haya. From Guam. A variety of the greater yam with purple inner skin and white flesh sometimes slightly tinged with purple. The flesh darkens somewhat when cooked, but possesses a rich flavor. The tubers are often large and of irregular shape. The vine is easily distinguished from that of

the preceding variety (No. 37943) by the reddish maroon color at each end of the petiole or leaf stalk.

**46801. DIOSCOREA ALATA.** Greater Yam. A West Indian variety of yam grown for several years near Miami, Fla. The tubers, which are white fleshed and drier than those of most varieties, are of good flavor though often rough and irregular in shape. Tubers sometimes reach a weight of 15 pounds in rich sandy loam or on well-drained muck soils.

**52575. DURANTA TRIACANTHA.** From Ambato, Ecuador. Seeds collected by Wilson Popence, Agricultural Explorer. An indigenous shrub common in ravines and on hillsides about Ambato. It grows to a height of 15 feet and is heavily armed with stiff, sharp spines. The pretty blue flowers, about half an inch broad, are borne in great profusion in racemes at the ends of the branches, and are followed by golden yellow berries, which suggest currants in appearance. Its relative, *D. plumieri*, which has smaller flowers and taller stature, has already proved successful in Florida. For trial as a hedge plant in California and Florida.

**51017. ELAEIS GUINEENSIS.** Oil Palm. From Buitenzorg, Java. Seeds presented by Dr. P. J. S. Cramer, director, Plant Breeding Station. A graceful palm, widely distributed throughout the Tropics, with a stout, deeply ringed trunk 20 to 30 feet high, crowned by large pinnate leaves with prickly leaf stalks. The bright-red fruits are used for food; an intoxicating drink is prepared from the juice of the stem; and the leaf stalks and leaves are used for thatching native houses. The most important product, however, is obtained from the fleshy outer layer of the fruits and from the kernels. The fleshy covering yields the ordinary palm oil used in the manufacture of soap and candles, while the kernels yield a white, or nut oil, employed in the manufacture of margarine, or artificial butter.

**52437. ELAEOCARPUS SIAMENSIS.** From Bangkok, Siam. Seeds collected by J. F. Rock, Agricultural Explorer. A handsome tree growing to a height of about 30 feet. The leaves are lanceolate, papery, 3 to 4 inches long; the white flowers, which occur in racemes, are followed by an abundance of seeds used by the natives as a narcotic. Recommended for trial as an ornamental in southern Florida.

**54897. ERYTHRINA MONOSPERMA.** From Honolulu, Hawaii. Seeds presented by Dr. H. L. Lyon. A tree 20 to 30 feet in height with spreading crown of stiff, gnarled branches, and clusters of brick-red, orange, or pale yellow flowers. The pods contain scarlet or dark-red seeds. The wood, which is soft and very light, was formerly used by the Hawaiians as floats on the outriggers of their dugout canoes. The tree is found in dry regions throughout the Hawaiian Islands; it is introduced for trial in California, Florida, and our tropical dependencies.

**55040. ERYTHRINA POEPPIGIANA.** From Mayaguez, Porto Rico. Seeds

presented by T. B. McClelland. An ornamental, red-flowered, leguminous tree, 40 to 50 feet in height, covered with short, conical spines. The species is native to the lower Andes of Peru, but is cultivated as a shade tree on coffee plantations in Porto Rico, where it is known as Bucare, and also as Palo de Bovo.

**54898. ERYTHRINA VARIEGATA.** Indian Coral Tree or Tiger's Claw. From Honolulu, Hawaii. Seeds presented by Dr. H. L. Lyon. A moderate-sized, quick-growing, deciduous tree, native throughout India from the foot of the Himalayas into Burma. The large, bright-red flowers are dried and used in the preparation of a dye. The bark is used for tanning and dyeing, and yields, also, an excellent straw-colored fiber. The leaves are used as cattle fodder. The bark and leaves are also used medicinally. The open-grained, light wood, which is durable and does not split or warp, is used for boxes, trays, toys, and for fire-wood. Much of the lacquered ware of India is made from the wood of this tree. For trial in California and Florida.

**48083. EUGENIA sp.** Seeds presented by P. D. Barnhart, Sawtelle, Calif., under the name *Eugenia hookeriana*. This is a handsome plant, especially adapted for ornamental plantings in California and Florida. The evergreen leaves are small and glossy; the young leaves and twigs a beautiful red. Plants respond well to shearing, and are adapted for hedge planting and as trained specimens for tubs.

**53577. GARDENIA LATIFOLIA.** From near Manikpur, in the forests of the low Vindhya Mountains, United Provinces, India. Seeds presented by Dr. L. A. Kenoyer and Mr. Winfield Dudgeon. A small tree, attaining 30 feet in height, with a rounded crown of dark, glossy foliage and large, fragrant, white flowers which turn yellow in the evening. The wood is white, tinged with yellow, close grained, durable, and easily worked. It is employed for making combs and has been recommended for turner's work and engraving. The species is common in dry regions throughout India, and may be recommended for trial in regions subject to little frost.

**52801. GEIJERA PARVIFLORA.** From Sydney, New South Wales. Seeds presented by George Valder. A tall ornamental shrub or small tree, native to the interior of New South Wales, where it reaches a height of 30 feet. It has slender, pendulous branches, narrow leaves, and when well developed is highly ornamental in appearance, suggesting a weeping willow. The tree is remarkably drought resistant, and in times of drought is a source of forage which is eagerly devoured by sheep and cattle. For trial in the Southern States.

**44433. GOURLIEA DECORTICANS SUBTROPICALIS.** From Argentina. Seeds presented by S. W. Damon. A tall tree with crooked, tapering trunk about 4 feet in diameter, pinnate leaves with small leaflets, and small orange-colored flowers produced in racemes. It is related to the yellow-wood tree (*Cladrastis lutea*) of Kentucky, Tennessee, and North Carolina, and is introduced for trial as an ornamental tree in mild-temperate and subtropical regions.

**51407. GUAIACUM GUATEMALENSE.** Lignum-vitae. From Guatemala City. Seeds secured through H. W. Goforth, American consul. A small tree, reaching about 25 feet in height, native to the hot dry plains of eastern Guatemala. It has a gnarled and twisted trunk, slender branches, small delicate leaves, and in February and March is literally covered with small flowers of a delicate lavender-purple color. The extremely hard wood is used in cabinet making. In southern Florida the species has proved resistant to light frost, and it is strongly recommended for trial as an ornamental plant for that region. Its growth is slow, but the plants when young are shapely and decorative in appearance.

**50679. GUILIELMA UTILIS.** Palm. From San Jose, Costa Rica. Seeds collected by Wilson Popenoe, Agricultural Explorer. This remarkable palm is of ancient cultivation in Costa Rica and deserves wide dissemination in the Tropics. It is a beautiful pinnate-leaved species, with slender trunk reaching not more than 50 feet in height. The fruits, of which as many as 5 or 6 stout racemes may be produced in a single crop, are top shaped, as much as 2 inches long, yellow to deep orange, with a hard seed in the center surrounded by an abundance of firm, orange-yellow starchy flesh. This is eaten after being boiled in salted water and, in texture and flavor, resembles boiled chestnuts, lending itself to a variety of table uses. Recommended for testing in Cuba, Porto Rico, the Virgin Islands, the Philippines, and elsewhere throughout the Tropics.

**51142. GUNDELIA TOURNEFORTII.** From Jerusalem, Palestine. Seeds presented by J. Ettinger. Native name Accoub de Syrie. This spiny composite, native to Persia, has buttonlike flower buds about the size of a large strawberry, which, when boiled and served with butter, make a delicious dish. The product is said to be the equal of asparagus, and more delicate in flavor than French artichokes. The plant is a perennial and requires 4 years to reach its maximum production; it is probably as long-lived as asparagus.

**52263. HEDYOTIS sp.** From Nyonki, Mongalla Province, Anglo-Egyptian Sudan. Seeds collected by Dr. H. L. Shantz, Agricultural Explorer. A beautiful plant, herbaceous or half-shrubby in character, which produces dainty tubular flowers like Bouvardias. Its trial is suggested in subtropical regions of the United States.

**49253. HIPPOCRATEA OBTUSIFOLIA.** From Victoria Falls, Rhodesia. Seeds collected by Dr. H. L. Shantz, Agricultural Explorer. A climbing shrub with opposite leaves and small flowers, followed by peculiar three-winged fruits. For trial as an ornamental in subtropical portions of the United States.

**51763. HYLOCEREUS sp.** White Pitahaya. From Bogota, Colombia. Seeds collected by Wilson Popenoe, Agricultural Explorer. A rare, edible-fruited cactus, half-climbing in habit, from the Andes of Colombia. The oval, light-yellow fruits, about 4 inches long, contain white,

translucent, juicy pulp of acidulous flavor, in which numerous small black seeds are embedded. In quality this is one of the best of the edible-fruited cacti of the Tropics. The plant is suited to subtropical climates, and may be recommended for trial in California, Florida, and high elevations in the Tropics.

24638. **ILEX CORNUTA.** Holly. From northern China. Seeds presented by Rev. J. M. W. Farnham. This highly ornamental evergreen holly has spiny, dark-green, glossy leaves, and in winter is loaded with clustered scarlet berries. While it does not make as symmetrical a crown as does the native holly of the Northern States, yet its attractive foliage and bright-colored fruits render it one of the finest of winter ornamentals for mild-wintered regions of the South and West.

53609. **IPOMOEA FICIFOLIA.** Morning-glory. From Buenos Aires, Argentina. Seeds presented by Benito Carrasco, director, Botanic Garden. A large, branching climber from Kamerun, Africa. The large, violet-rose-colored flowers appear from August to October. Suited for porches, screens, and pergolas in mild-wintered regions.

49907. **IRIS DICHOTOMA.** Iris. From China. Seeds presented by N. H. Cowdry. This attractive small iris is distinct from those commonly grown for decorative purposes in the continued paired branching of its flower stalk, its late flowering, and in the fact that it opens its attractive purple flowers only in the afternoon. The species should prove of especial interest to iris fanciers.

47195. **LANSIUM DOMESTICUM.** Langsat. From Buitenzorg, Java. Seeds presented by the director of the Botanic Garden. A medium-sized, rather slender tree native to the Malay Archipelago, which produces an edible fruit not unlike the loquat in general appearance and about the size of a French prune. The flesh separates into segments resembling those of an orange, and is white, translucent, very juicy, highly aromatic, and of a subacid, pungent flavor. It is eaten fresh or prepared in a variety of ways. For trial in tropical America only, where it is not yet well known.

53466. **LIVISTONA** sp. Palm. From Bangkok, Siam. Seeds collected by J. F. Rock, Agricultural Explorer. The leaves of this palm are terminal and fan shaped, divided into numerous segments which are split at the apex. The leaf stalks are sheathed at the base in a mass of netted fibers. This introduction probably represents a new species. The large, oval, blue fruits are commonly sold in the Siamese markets and are boiled and eaten by the natives.

49088. **MALUS SIEBOLDII ARBORESCENS.** Originally from Japan. Seeds presented by the Arnold Arboretum. Under ordinary conditions this is a shrub with pink flowers, sometimes becoming a small tree and bearing white flowers. The red or yellow fruits are the size of peas, and of no value. The foliage assumes a beautiful red color in autumn, making the plant desirable as an ornamental. For trial also as a stock for the cultivated apple.

43155. **MALUS SYLVESTRIS.** Apple. Variety Coldstream Guards. From New Zealand. Plants presented by H. R. Wright. This variety is recommended by Mr. Wright as a first-class early summer dessert apple of medium to large size, smooth, round, of bright color, and very attractive appearance, resembling closely Red Astrakhan. The tree is hardy, healthy, and a heavy cropper. No fruits of this variety have been produced in this country.

43157. **MALUS SYLVESTRIS.** Apple. Variety Diadem. From New Zealand. Plants presented by H. R. Wright. A very handsome large fruit with beautiful light-red skin and cream-white flesh of splendid texture and flavor. Fruits ripen at the Plant Introduction Garden, Chico, Calif., about August 30. This variety promises to be a very valuable addition to the late summer apples grown in this country. It is excellent for the market both as a dessert and as a cooking apple.

43158. **MALUS SYLVESTRIS.** Apple. Variety Edward Lippiatt. From New Zealand. Plants presented by H. R. Wright. A variety said by Mr. Wright to produce large fruits having a yellow skin streaked with a lively crimson, and white, crisp, juicy, sweet flesh with a fine aromatic perfume and an exceedingly rich flavor. No fruits of this variety have yet been produced in this country.

43159. **MALUS SYLVESTRIS.** Apple. Variety General Carrington. From New Zealand. Plants presented by H. R. Wright. Described as a late-ripening, large, handsome fruit with yellow skin beautifully striped with crimson. The flesh is yellowish white, rich, crisp, juicy, sugary, and of delicious flavor. The tree is strong and vigorous, of upright habit, and in New Zealand is said to be resistant to blight. It has not yet fruited in this country.

43160. **MALUS SYLVESTRIS.** Apple. Variety George Neilson. From New Zealand. Plants presented by H. R. Wright. Reported by Mr. Wright to be a large, early apple resembling Red Astrakhan, of which it is said to be an improvement. The variety has not yet fruited in this country.

43164. **MALUS SYLVESTRIS.** Apple. Variety Lilydale. From New Zealand. Plants presented by H. R. Wright. Recommended by Mr. Wright as an early dessert apple. It has not yet fruited in this country.

43172. **MALUS SYLVESTRIS.** Apple. Variety Taupaki. From New Zealand. Plants presented by H. R. Wright. This variety is said to produce highly colored, perfectly shaped fruits with yellow skin striped with crimson. A good keeper. The fruits are as yet unknown in this country.

43174. **MALUS SYLVESTRIS.** Apple. Variety Willie Sharp. From New Zealand. Plants presented by H. R. Wright. The fruit of this variety is said to be a beautiful, medium-sized dessert apple with yellow skin and crisp flesh of vinous flavor. No fruits have as yet been produced

in this country.

54093. **MALUS ZUMI.** Dwarf Apple. Originally from the mountains of central Japan. Seeds presented by the Arnold Arboretum. A low and much-branched tree growing to 20 feet in height and having a rounded crown of twiggy growth. The pinkish flowers are borne in great profusion and are followed by red fruits. This variety, said to be a large-fruited form, was propagated for trial as a stock plant.

54094. **MALUS ZUMI.** Dwarf Apple. Originally from the mountains of central Japan. Seeds presented by the Arnold Arboretum. This is reported to be a small-fruited form of the preceding.

42463. **MARANTA ARUNDINACEA.** Arrowroot. From Jamaica. Tubers presented by W. Harrison, superintendent, Hope Gardens. This attractive plant yields the true West Indian arrowroot, much used as a food for children and invalids. It succeeds on the Gulf coast and in Florida, and is easily raised. It is not a new introduction, having been planted in Florida many years ago, but it seems worthy of wider dissemination than it has yet had, and it may be feasible to cultivate it commercially in certain regions. The species should be tested with this object in view. Plants are set in the spring and the tubers harvested the following autumn.

49893. **MIDA ACUMINATA.** Quandong. From Sydney, New South Wales. Seeds presented by the Forestry Commission of New South Wales. The quandong, sometimes called "native peach," is a handsome small evergreen tree from the drier and hotter parts of New South Wales. It is remarkably resistant to drought and to the hot winds which periodically blow over its native region. The leaves are much relished by sheep and cattle; the red fruit, about three-fourths of an inch in diameter, is used for jellies and preserves resembling guava in flavor. The kernels are palatable and yield abundant illuminating oil. The bark contains a large amount of tannic acid; the wood is used for turnery, carving, and cabinet work. For trial in the Southwestern States.

51614. **MYRCIARIA EDULIS.** Cambuca. From Brazil. Seeds presented by P. D. Barnhart, Los Angeles. A handsome evergreen tree commonly cultivated in the state of Rio de Janeiro, Brazil, for its edible fruits which are produced both on the small limbs and on the trunk of the tree. The orange-colored oval fruits are about  $1\frac{1}{2}$  inches long, with a firm, leathery, very acrid pericarp surrounding the inner pulp, which constitutes the edible portion of the fruit. This pulp is soft, translucent, and jellylike, with a pleasing, subacid flavor. The fruits are much esteemed by the Brazilians. For trial in California and Florida.

53982. **MYRICA RUBRA.** Yang mae. From Foochow, Fukien, China. Seeds presented by C. R. Kellogg. A handsome evergreen shrub or small tree, cultivated for its beautiful, dark-purple, edible fruits, the size of crab apples, which may be eaten out of hand or made into

compotes, pies, and sirups. The tree thrives in well-drained, rocky terraces and is suited to the milder sections of the Gulf coast states and California.

**49796. MYROXYLON ELLIPTICUM.** From the mountains near Antigua, Guatemala. Seeds collected by Wilson Popenoe, Agricultural Explorer. An evergreen, ornamental shrub or small tree, with formidable thorns. When in fruit the plant is rendered very attractive by its red berries, which are about the size of peas. The shrub is suggested for trial as a hedge plant in California and Florida.

**50685. NECTANDRA GLABRESCENS.** Aguacatillo. From Rancho Redondo, near San Jose, Costa Rica. Seeds collected by Wilson Popenoe, Agricultural Explorer. A round-topped tree reaching about 40 feet in height. The fruits are interesting because of their resemblance to the Mexican avocado; they are obovoid, about 2 inches long, black and shining, thin skinned, and strongly anise flavored. Of interest to students of the avocado who may care to grow the species as a curiosity and for possible value in breeding work. It should be sufficiently hardy for cultivation in the avocado-growing sections of California and Florida.

**54332. OCHROMA LAGOPUS.** Balsa Wood. From Camaguey, Cuba. Seeds presented by Dr. Roberto L. Luaces. A valuable tropical tree reaching 40 feet in height, with the flowers borne at the ends of the branches. The fruit, which is about a foot in length, opens by 5 slits, when ripe, out of which the silk-cotton of the seeds protrudes and spreads over the whole surface. The wood is lighter and much stronger than basswood and is used for insulating and other purposes. The tree is now being planted commercially in certain tropical countries to supply a rapidly growing demand for the wood.

**51519. OLEA CHRYSOPHYLLA.** Golden-leaved Olive. From Ukamba Province, Kenya Colony. Seeds collected by Dr. H. L. Shantz, Agricultural Explorer. This plant, the wild olive of the highlands of East Africa, is noteworthy because of the drab or golden color of the under side of the leaves. The small flowers are followed by the large blackish fruits. For trial as an ornamental in the Southern States and California.

**53485. OSTEOMELES OBTUSIFOLIA.** From Loja, Ecuador. Seeds collected by Wilson Popenoe, Agricultural Explorer. A treelike shrub reaching 12 to 15 feet in height, with abundant, dark-green foliage, and armed with long sharp thorns. The small red fruits, which are borne in terminal clusters, have the flavor of haws though not commercially valuable. The plant is said by Mr. Enrique Witt to be utilized in Loja as a stock on which to graft the cultivated apple, for which purpose it is introduced for trial in the United States.

**51730. PANDANUS POLYCEPHALUS.** Screw Pine. From Buitenzorg, Java. Seeds presented by Dr. P. J. S. Cramer, director, Plant Breeding Station. An East Indian decorative plant, with leaves about 3 feet

long and 2 inches wide. The native East Indians eat the young snow-white leaves, which are tender and sweet, and also the unopened flower heads. The screw pines are among the finest decorative plants, and when grown under favorable conditions are easily managed. They thrive, as a rule, in much heat and with plenty of water.

**51700. PARTHENIUM ARGENTATUM.** Guayule. From Marfa, Texas. Plants presented by R. A. Epperson. A small, spreading shrub, native to a restricted area in southwestern Texas and northern Mexico, where it is exploited commercially for the rubber which is obtained from it. The plant has been utilized extensively for its rubber, and is worthy of trial in regions with arid, subtropical climates similar to that of the region mentioned above. The shrub rarely attains to a height greater than 3 feet; it has small, silvery gray leaves and bears yellow composite flowers.

**52613. PASSIFLORA sp.** Tacso. From Ambato, Ecuador. Seeds collected by Wilson Popenoe, Agricultural Explorer. A handsome ornamental climber from the Ecuadorian Andes, where it is cultivated in gardens for its edible fruits, which are oblong, about 3 inches in length, orange-yellow in color, containing orange pulp of acid, aromatic flavor, very agreeable when strained and mixed with milk and sugar to form a sherbet, or when used for making refreshing drinks of other sorts. The plant is a vigorous climber, excellent for covering porches, screens, or arbors. The attractive deep-pink flowers are 3 inches broad. For trial in California and Florida.

**53181. PASSIFLORA sp.** Tacso. From Ecuador. Seeds collected by Wilson Popenoe, Agricultural Explorer. A wild species of passion vine from the mountains near El Angel, Ecuador, where it grows abundantly at elevations of about 10,000 feet. It should prove sufficiently hardy for cultivation in California and Florida. The plant is an excellent ornamental, with abundant foliage of attractive appearance, and large, pink flowers. The slender oblong fruits, suggesting cucumbers in appearance, contain orange-colored, subacid pulp similar in flavor to that of the other tacsoes of northern South America.

**40992. PASSIFLORA EDULIS.** Granadilla. From Tucuman, Argentina. Seeds presented by E. F. Schultz, horticulturist, Agricultural Experiment Station. A yellow-fruited variety of the common passion fruit or purple granadilla, which is recommended as superior in quality. It is produced by a strong-growing vine which is sufficiently frost resistant for cultivation in California and Florida, and which is highly ornamental in character, and valued for covering arbors and pergolas. The oval fruit, about the size of a hen's egg, has a thick, brittle shell inclosing numerous small black seeds, each surrounded by soft, translucent, juicy pulp, of aromatic, somewhat acid flavor.

**51567. PASSIFLORA MANICATA.** Curuba de Indio. Seeds collected by Wilson Popenoe, Agricultural Explorer. A handsome climber from the highlands of Colombia, probably suitable for cultivation in California and Florida. It is useful for covering screens and in addition pro-

duces an edible fruit, the size and shape of a small cucumber, green externally and containing yellow, translucent, subacid pulp used for making refreshing drinks. The large pink flowers, about 2 inches broad, make the plant of value as an ornamental, and its fruit, when properly prepared, is delicious.

**54035. PASSIFLORA REFLEXIFLORA.** Granadilla. From Guayaquil, Ecuador. Seeds collected by Wilson Popenoe, Agricultural Explorer. One of the native Ecuadorian species of Passiflora which produces edible fruits, said to be of excellent quality. The flowers are large and handsome, and the vine, which has attractive foliage, is prized for its beauty in tropical regions. Probably sufficiently frost-resistant to be cultivated in extreme southern Florida.

**36270. PERSEA AMERICANA.** Simmonds Avocado. Budded plants available from a selected seedling which originated at Miami, Fla., where it has proved a good bearer, and a valuable sort for midsummer use. The fruit is oval in form, about 24 ounces in weight, yellowish green in color, with a smooth leathery skin and deep-yellow flesh of melting, buttery texture and rich nutty flavor. The seed is not large in proportion to the size of the fruit. This variety belongs to the West Indian race which is not suitable for cultivation in California.

**55736. PERSEA AMERICANA.** Itzamna Avocado. Budwood sent from Guatemala by Wilson Popenoe, Agricultural Explorer. This variety was not distributed along with others introduced from Guatemala in 1916-17, as no buds were saved at Washington, and only one was successfully established at Miami, where several budsticks of the original shipment were sent. For a year or more the variety was considered lost. When it came into bearing at Miami, less than 2 years after the original buds were top-worked on an old tree of the West Indian race at the Plant Introduction Garden, it was seen to be sufficiently meritorious to justify a wider trial. In habit and character of growth it is excellent; the branches are strong, not drooping, and the growth vigorous. The fruits, which ripen at Miami during February and March (about mid-season for the Guatemalan race) are slender pear-shaped, about 18 ounces in weight, dark green, with the surface somewhat rough, the skin thick and woody, and the flesh cream-yellow, smooth and free from fiber, of rich flavor and excellent quality. The seed is rather small, and tight in the cavity.

**46337. PERSEA AMERICANA.** Gottfried Avocado. A variety of the Mexican race, which originated as a seedling in the Plant Introduction Garden, Miami, Fla., and has proved successful in the northern portions of the Florida avocado belt. It is of average hardiness for its race, withstanding without injury temperatures of about 25° F. The fruits are large, weighing from 12 to 18 ounces; they are oval to oblong-pyriform, purplish green, thin skinned, with yellow flesh of rich flavor, and with a moderately small seed. The chief defect of the variety is the presence of fiber in the flesh, a characteristic quite common among Mexican avocados. For trial in regions slightly too cold for the Guatemalan and West Indian varieties.

50666. **PHYLLOCARPUS SEPTENTRIONALIS.** From Department of El Progreso, Guatemala. Seeds collected by Wilson Popenoe, Agricultural Explorer. A beautiful flowering tree of eastern Guatemala, rivaling in splendor the royal poinciana. It has pinnate foliage, deciduous during a short period, at which time the crimson-scarlet flowers appear and cover the entire tree. The species is probably no more frost resistant than the poinciana, and should be tested in regions where the latter flourishes. It may flower at a different season, and for this reason prove of particular value.

23261. **PHYLLOSTACHYS** sp. Bamboo. From Fengtai, near Peking, China. Plants collected by Frank N. Meyer, Agricultural Explorer. This hardy bamboo has been found to withstand the winters as far north as Philadelphia. It grows commonly in gardens in and around Peking and Tientsin, where the climatic conditions are much too rigorous for the ordinary timber bamboos. It is valued for flower stakes, fishing rods, and similar articles. Chinese name "Chu tse." It spreads by means of underground rhizomes which are difficult to eradicate, and should be planted only on land not wanted for other crops.

55713. **PHYLLOSTACHYS** sp. Bamboo. From Tangsi, Chekiang, China. Collected by Frank N. Meyer, Agricultural Explorer. A small-growing variety not over 10 feet in height, forming low dense thickets. The small wiry stems make excellent plant stakes and small fishing rods. It is fairly hardy, withstanding considerable frost. It spreads by means of underground rhizomes which are difficult to eradicate and should only be planted on ground devoted to its culture.

40851. **PHYLLOSTACHYS BAMBUSOIDES.** Bamboo. Introduced, probably from the East Indies, by Andreas E. Moynelo, who made the original planting near Burroughs, Ga. This form seems to differ in no essential character from the best of the Japanese timber bamboos. The culms reach a height of 60 feet or more, and with their plumelike foliage possess a highly ornamental quality. Although not considered in Japan as palatable as those of *P. pubescens*, the young shoots of this species furnish a delicious early vegetable. The timber is adapted to a wide variety of uses. It combines lightness with great strength and durability, is easily worked, and gives a characteristic ornamental effect. For ages bamboo timber has been utilized in the Orient in an infinite variety of ways, but only in the past few years have a few forward-looking Americans glimpsed the possible future development of a bamboo industry in this country. Since this species spreads and makes a grove rapidly by means of deep underground rhizomes which are difficult to dig up, it should be planted on land which it is expected will not be required for other crops.

21970. **PISTACIA CHINENSIS.** Chinese Pistache. From Shantung, China. A very promising shade tree for those sections of the United States where the summers are warm and the winters only moderately cold. The young leaves are carmine-red, and the autumn foliage a gorgeous scarlet and yellow. The wood, which is decidedly heavy, and not often attacked by insects, is used in the manufacture of furniture. From the

seeds an oil is obtained which is used for illuminating purposes. The young, partly opened foliage buds, boiled like spinach, are sometimes eaten by the Chinese.

**51877. *POPULUS MAXIMOWICZII*.** Japanese Poplar. Cuttings presented by John Dunbar, assistant superintendent of parks, Rochester, N. Y. A stately tree, native to Siberia and Japan, from an ornamental standpoint one of the best of all poplars. The trunk reaches 6 feet in diameter and 100 feet in height. The foliage remains on the tree until late in the autumn and appears in the spring 10 days earlier than that of most other trees. The crown is shapely and symmetrical. In addition, the species is said to thrive on thin gravelly soil too poor for Norway spruce and white ash. It is highly recommended for planting in the Northern States.

**39432. *PRINSEPIA UNIFLORA*.** From near Fuchengchen, Shansi, China. Seeds collected by Frank N. Meyer, Agricultural Explorer. A spiny bush of spreading habit with pale, rosy flowers which occur in great profusion in May, and are followed by dark-red fruits resembling small cherries. The fruits are quite juicy, but sour. There is considerable variation, however, as to the size and acidity of the fruits, some being pleasant when eaten out of hand. By selection a strain might be secured that would be suitable for cultivation as a garden fruit. For its ornamental quality alone the shrub is worthy of cultivation. It has proved hardy in the Arnold Arboretum near Boston.

**34270. *PRUNUS ARMENIACA*.** Apricot. Variety Crisomelo. From Rome, Italy. Seeds presented by Dr. Gustav Eisen. A very large, rounded-oblong apricot of orange color mottled with red. The flesh is juicy and of a delicious flavor. The plants under this number are budded from a selected seedling.

**18587. *PRUNUS PSEUDO-CERASUS*.** Tangsi Cherry. Scions secured by Frank N. Meyer, Agricultural Explorer, at Tangsi, China. An entirely new species of fruiting cherry, which matures its small fruits of excellent quality 10 days earlier than the earliest ripening cherry hitherto known in California. The tree makes a vigorous growth in mild climates, and is worthy of the consideration of plant breeders and cherry growers generally. The name *Prunus pseudo-cerasus* was, until recently, erroneously applied to the Japanese flowering cherry, *P. serrulata*.

**43181. *PRUNUS SALICINA*.** Japanese Plum. Variety Wright's Purple. From New Zealand. Plant presented by H. R. Wright. The fruit is a medium-sized, dark-purple plum with brownish yellow, firm flesh of good flavor. For home use this species is well adapted. It ripens at the Plant Introduction Garden, at Chico, Calif., about August 25.

**43182. *PRUNUS SALICINA X (?)*.** Plum. Variety Best's Hybrid. From New Zealand. Plant presented by H. R. Wright. A medium-sized, greenish yellow plum of good flavor, which promises to be a good early canning variety. The pit is of medium size, cling. The tree yields heavily.

32671. **PRUNUS SPINOSA X DOMESTICA.** Hybrid Plum. From Kozlov, Russia. Scions presented to Frank N. Meyer, Agricultural Explorer, by I. V. Mijurin, the originator of the hybrid. This hybrid between the green Reine Claude and the Sloe (*P. spinosa*) produces medium-sized, pleasant-flavored fruits with a lingering aftertaste all their own. The trees are very productive and vigorous, and are worthy of trial in our coldest regions.

32673. **PRUNUS SPINOSA X DOMESTICA.** Hybrid Plum. From Russia. Scions presented to Frank N. Meyer, Agricultural Explorer, by the originator, I. V. Mijurin. The fruits are of medium size, freestone, greenish yellow, covered with a heavy bloom. The flesh is firm and rather dry, but of good flavor. The fruits are excellent for canning or for shipping. This hybrid between the green Reine Claude and the Sloe (*P. spinosa*) is worthy of trial in our coldest regions.

36086. **PRUNUS TOMENTOSA.** Bush Cherry. From Tientsin, China. Seeds collected by Frank N. Meyer, Agricultural Explorer. An ornamental fruiting shrub adapted to nearly all regions of the United States. The small white flowers, tinged with rose, are followed by small fruits which are suitable for preserves and jelly. The Chinese bud or graft this bush cherry on the remarkably thrifty wild peach, *Amygdalus davidiana*, on which stock it makes a more vigorous growth and is better able to withstand drought and other adverse conditions than when grown on its own roots. Its extreme hardiness and its ornamental character suggest the value of this remarkable species for hybridizing experiments.

52390. **PTEROCARPUS MACROCARPUS.** From Korat, Siam. Seeds collected by J. F. Rock, Agricultural Explorer. This tree, known to the natives as Mai Padou, is one of the finest timber trees of Siam. It grows to a height of 150 feet, with a girth of 10 feet, four feet above the ground. The wood is very hard and is splendidly adapted for furniture and for construction work. Practically all the timber produced by this tree in Siam is bought by Japan. This species may do well in Cuba, Porto Rico, and tropical America generally, but it is too tender for the mainland of the United States.

24825. **PUNICA GRANATUM.** Pomegranate. Plants received from La Tour-de-Peilz, Vaud, Switzerland. A type of pomegranate remarkable for its vigor and hardiness. It is supposed to be the only variety with double flowers which will ever ripen its fruits in a climate like that of central France, and even near Paris, if planted in a favorable exposure. The tree is valued chiefly as an ornamental.

27049. **PUNICA GRANATUM.** Pomegranate. Variety Krylezy-Kabu. From near Sukhum-Kale, Caucasus. Cuttings secured by Frank N. Meyer, Agricultural Explorer. The fruits of this variety are medium sized, with little tendency to crack. The skin is a uniform deep red and of medium thickness. The grains are deep red, with very juicy, slightly acid pulp, having a rich vinous flavor. This sort closely resembles the well-known variety "Wonderful."

**27966. PUNICA GRANATUM.** Pomegranate. Variety Kyrmishi Kabugh. From the Caucasus, Russia. Cuttings secured by Frank N. Meyer, Agricultural Explorer. The fruits of this variety are large, with a thick skin of a uniform deep-crimson color. The core is large; the grains deep crimson, with juicy, semiacid pulp of rather rich flavor. The seeds are hard.

**30615. PUNICA GRANATUM.** Pomegranate. Plants received through Dr. T. H. Kearney, of this Department; originally presented by Miss Ida Munro, Putnam, Ga. The fruits are of medium dimensions with a thin light skin. The core is small, the grains bright rose-colored, sweet, juicy, and well flavored, with rather hard seeds. This tree is a prolific yielder and is worthy of trial wherever pomegranates do well.

**33227. PUNICA GRANATUM.** Pomegranate. Variety Negro Monstruoso. Original cuttings received from Granada, Spain, by Dr. Walter T. Swingle of this Department. This is one of the principal varieties grown in the vicinity of Granada. It is of the "Spanish Sweet" type, and has proved well adapted to the pomegranate regions of California. The plant is large and spreading and very productive. Its fruits are a beautiful red, of large size and excellent flavor. The grains are light red with soft seeds.

**33207. PYRUS COMMUNIS.** Pear. Variety Favorita. From Granada, Spain. Plants introduced by Dr. Walter T. Swingle, of this Department. A large, full-necked pear strongly resembling the Bartlett in general appearance. It is greenish yellow splashed with red, and has tender, melting, juicy flesh. The variety has produced fruit in California, where it appears to be highly successful. It is strongly recommended for trial in the pear-growing regions of the United States.

**38263. PYRUS SEROTINA.** Pear. From Honan, China. Scions collected by Frank N. Meyer, Agricultural Explorer. A variety with large, round-oblong fruits of a dark-yellow color. The pear is not a good keeper, but it may prove of value for canning, and is superior to Kieffer for eating. It appears to be blight resistant. Chinese name Pin li (luscious pear). The best of Meyer's Chinese pears.

**52393. QUERCUS LINDLEYANA.** Oak. From Bangkok, Siam. Seeds collected by J. F. Rock, Agricultural Explorer. A tree valued for its edible acorns and for its timber. It occurs in Siam on gravelly or shady slopes and grassy pine lands at altitudes of 2,400 to 5,000 feet. The acorns, which are sweet and palatable when roasted, are produced in great abundance. This species should be tested in Florida and California.

**52443. QUERCUS POLYSTACHYA.** Oak. From Siam. Seeds collected by J. F. Rock, Agricultural Explorer. This medium-sized tree bears small, edible acorns in densely packed spikes sometimes containing as many as 100 nuts. The species seems to be quite adaptable as to its soil requirements. It should be tested in California and Florida.

54433. **QUERCUS SERRATA.** Seeds presented by John Dunbar, assistant superintendent of parks, Rochester, N. Y. An oak, native to Japan and Chosen, which has proved hardy in the United States as far north as Massachusetts. A very ornamental species whose leaves remain green until late in the autumn, when they assume a dull yellow color. The tree reaches 80 feet in height, and resembles *Castanea crenata*.

52396. **QUERCUS SOOTEPENSIS.** Oak. From Bangkok, Siam. Seeds collected by J. F. Rock, Agricultural Explorer. A medium-sized tree with narrowly elliptical or oblong ovate leaves. The solitary acorns are said to be eaten roasted by the natives. The species occurs in Chiengmai and Sootep, in rather open jungle at altitudes of 2,500 to 3,000 feet. Introduced for trial in the warmest parts of this country.

52397. **QUERCUS THOMPSONI.** Oak. From Bangkok, Siam. Seeds collected by J. F. Rock, Agricultural Explorer. This oak, which reaches a height of 80 feet, is valued for its flat, thin shelled, sweet-flavored acorns, which are eaten roasted. The timber is valued for fuel. The tree is rather adaptable as to its soil requirements and should be tested widely in California and Florida.

52391. **QUERCUS TRUNCATA.** Oak. From Bangkok, Siam. Seeds collected by J. F. Rock, Agricultural Explorer. This oak, which thrives in the deciduous forests of northern Siam in quartz-sand soil, yields immense crops of thick-shelled, edible acorns about an inch long and not quite an inch thick. The acorns are borne in dense spikes which sometimes grow together in a fan-shaped mass. The entire spikes, still bearing their nuts, fall when the nuts are mature, and literally cover the ground. The roasted nuts are eaten by the natives.

49386. **RANDIA ACULEATA.** From Alta Verapaz, Guatemala. Seeds collected by Wilson Popenoe, Agricultural Explorer. This is an attractive shrub which, because of its formal appearance and symmetrical shape should prove of value for hedges. It strongly resembles the box-tree in general appearance. The fruits, which are white when ripe, round, and about half an inch in diameter, increase the ornamental appearance of the plants. It should be tested in southern Florida and southern California.

54118. **ROSA CAUDATA.** Rose. Originally from western China. Seeds collected at the Arnold Arboretum. A tall, vigorous shrub with stout, arching stems, dark-green foliage, and red flowers about 2 inches across. To plant breeders who are working with this genus, this plant should prove of interest.

50681. **RUBUS** sp. Blackberry. From San Jose, Costa Rica. Seeds collected by Wilson Popenoe, Agricultural Explorer. A wild blackberry of the Costa Rican highlands, where it forms half-trailing masses 6 or 8 feet above the ground, and yields an abundance of dark-purple fruits an inch long, resembling in appearance and flavor the cultivated blackberries of the United States. The species is probably not very frost resistant, and should be tested in mild-wintered sections of the South-

western and Gulf states.

**50907. RUBUS** sp. From Zanzibar. Seeds collected by Dr. H. L. Shantz, Agricultural Explorer. A vinelike plant bearing moderately sweet fruits resembling red raspberries. A plant particularly interesting to plant breeders.

**49331. RUBUS ADENOTRICHOS.** Blackberry. From Tactic, Guatemala. Seeds collected by Wilson Popenoe, Agricultural Explorer. A species widely distributed in the highlands of tropical America. It is strong-growing, half climbing in habit, and produces an abundance of excellent berries resembling in size, appearance, and flavor, the cultivated blackberries of the United States. In this country it should be tested in the South and West; and it may be of value to plant breeders for crossing with other species of Rubus.

**49332. RUBUS GLAUCUS.** Andes Berry. From Tactic, Guatemala. Seeds collected by Wilson Popenoe, Agricultural Explorer. A remarkable raspberrylike bramble from the highlands of tropical America, where it is found, wild and cultivated, from southern Mexico to Peru. The plants grow to immense size, and have whitish canes resembling those of the red raspberry; the fruits are more like the loganberry in character, but are broader in form and sweeter in flavor. They have small seeds, are juicy and luscious, and delicious for eating either with sugar and cream, or prepared as sauce, jam, etc. The plant thrives on a variety of soils and under varying conditions of moisture. Owing to its tendency to produce wood the vine must be pruned in order to encourage the growth of fruiting laterals. The plant is not hardy, but should prove sufficiently frost resistant for cultivation on the Pacific coast and possibly in southern Texas and in Florida.

**53757. SALVIA SQUELENS.** From Ecuador. Seeds collected by Wilson Popenoe, Agricultural Explorer. This is a handsome species which grows commonly on dry rocky slopes. The tubular flowers, produced in spikes, vary in color from a beautiful salmon-pink or coral-pink to bright scarlet. This species should be tested as an annual flowering plant.

**49314. SCHEFFLERODENDRON GAZENSE.** From Lourenco Marques, Mozambique. Seeds collected by Dr. H. L. Shantz, Agricultural Explorer. This is an attractive leguminous tree common in the coastal forests of East Africa. For trial in the southern parts of California and Florida.

**54695. SOLANUM PIERREANUM.** From French Equatorial Africa. Seeds presented by Dr. A. Robertson Proschowsky, Nice, France. An herbaceous plant grown for its highly ornamental and edible red fruits, which are the size of walnuts. It is recommended as an ornamental plant for southern climates.

**51394. SOLANUM QUITOENSE.** From Bogota, Colombia. Seeds collected by Wilson Popenoe, Agricultural Explorer. A half-shrubby plant with large, soft, purplish leaves which are decorative to a high degree.

The fruits are the size of a small orange, and are covered with soft hairs which are rubbed off by hand. The thin skin surrounds a quantity of very juicy, translucent pulp and numerous small seeds. The juice is much used in northern South America in the preparation of ices and refreshing drinks, which suggest a mixture of pineapple and lemon in flavor. The plant should be tried in the southern United States, where it is likely that best results will be obtained by starting plants in the greenhouse and transplanting to the open ground as soon as danger from frosts is past. By this procedure it may be possible to secure fruits the first summer. Plants are injured by a temperature below 30° F., and should be tried as perennials only in the most favored portions of California and Florida.

**40597. SORBARIA ARBOREA.** Originally from China. Plants presented by Vicary Gibbs, Elstree, Herts, England. A handsome, upright shrub with rather large, bright-green, compound leaves and small white flowers in large, showy panicles, which appear in summer and are followed by small, capsular fruits. The handsome foliage develops very early in the spring. The species thrives in a rather moist, rich soil and does well in somewhat shaded situations. May be propagated by hard-wood cuttings, root cuttings, suckers, or seeds.

**52459. SPIRAEA MYRTILLOIDES.** Native to western China. Seeds presented by Vilmorin-Andrieux & Co., Paris. A very graceful shrub, 6 to 12 feet high, of spreading habit. It has somewhat papery leaves and produces dense masses of small white flowers. The species occurs in western Szechwan at 9,000 to 15,000 feet altitude, and may prove suitable for cultivation in the Southern States.

**42596. STRYCHNOS SPINOSA.** Kafir Orange. From Inhambane, Mozambique, Africa. Seeds presented by Rev. P. W. Keys. A remarkable East African shrub or small tree with evergreen foliage and short spines. The large round fruits, with extremely hard shells, turn yellow when ripe and have the fragrance of cloves. The flesh is edible, suggesting the taste of a brandied peach. It succeeds in southern Florida and in protected situations in California.

**43741. TECOMA ARGENTEA.** From Asuncion, Paraguay. Seeds presented by C. F. Mead. A small tree from Paraguay and southeastern Brazil. When the huge clusters of yellow flowers appear, it is a strikingly attractive ornamental. From the behavior of young plants in southern Florida, where some have already flowered, it may be said that the species is a promising one for that region.

**53470. TERMINALIA MYRIOCARPA.** From Calcutta, India. Seeds collected by J. F. Rock, Agricultural Explorer. A valuable timber tree of northwestern Assam where it reaches a height of 80 to 100 feet in the more open forest lands. The tree is evergreen, and very handsome when in flower or fruit, its pendent boughs being loaded with panicles of pink flowers and yellow fruits. The heartwood, which is brown mottled with dark streaks, takes a beautiful polish. The tree ascends to 5,000 feet altitude in Assam, Bhutan, and upper Burma. Suggested

for trial in southern Florida.

**49166. THUNBERGIA sp.** Victoria Falls, Rhodesia. Seeds collected by Dr. H. L. Shantz, Agricultural Explorer. A tall, perennial climber with fragrant white flowers followed by black 4-seeded capsules. The thunbergias are vigorous greenhouse climbers, free-flowering, and handsome ornamentals. In Florida they are largely used on porches, trellises, as screens, etc. This species should be tested in southern California and southern Florida.

**50588. ULMUS PUMILA.** Elm. Seeds presented by the Forestry Department, Ministry of Agriculture, Peking, China. A medium-sized tree remarkably resistant to drought, alkali, and severe extremes of temperature. It has proved exceptionally valuable as a shade tree in the semiarid regions of the United States, where it has made phenomenal growth. It also seems well adapted to the cold northern plains of this country. A remarkable tree which is recommended highly, especially for regions unsuited to most of the common shade trees.

**47574. VERONICA sp.** From New Zealand. Seeds presented by J. W. Poynton. An attractive, large-leaved shrub with purple flowers. The New Zealand veronicas, of which there are many species, succeed in California where one or two are highly esteemed as ornamental shrubs. This and the following number should, therefore, be given a careful trial in that state.

**47575. VERONICA sp.** From New Zealand. Seeds presented by J. W. Poynton. An ornamental shrub bearing small leaves and attractive light-blue flowers.

## Introduced Varieties of the Jujube.

Note: **ZIZIPHUS JUJUBA**, the true jujube, is one of the five principal fruits of China. It occurs in many excellent horticultural varieties, and has been cultivated for at least 4,000 years. The four kinds described below were secured and introduced into the United States by the late Frank N. Meyer, who made an exhaustive study of the jujube industry in the Orient. Meyer visited many orchards and sampled the fruits from the trees; he noted the behavior of trees on various soils and in different climatic conditions; he investigated the method of girdling trees to make them bear; and he learned how the fruits were processed and otherwise prepared for use. Meyer's investigations in China and tests carried on at Chico, California, and elsewhere for the past 10 years have convinced us that the jujube is suited for commercial cultivation in the semiarid regions of the Southwest where soil alkalinity, early spring frosts, and a light rainfall limit the growing of many other fruits.

Jujubes are utilized in China in a great variety of ways. The fresh fruits of some varieties may be eaten out of hand; they are sometimes boiled with millet and rice, or they may be stewed or baked. Sometimes they are used, raisin-fashion, to make jujube bread; when they are processed, or turned into glace fruits by scoring them and boiling them in honey and sugar syrup, they are strikingly like dates. Experiments with the fruits in this country have demonstrated the possibility of their being utilized as a dainty and delectable confection when processed.

**22684. ZIZIPHUS JUJUBA.** Mu shing hong jujube. From Tsintse, Shansi Province, China. Scions collected by Frank N. Meyer, Agricultural Explorer. Fruits ellipsoidal in form, somewhat flattened at the ends, and of large size, sometimes as much as  $1\frac{3}{4}$  inches long by  $1\frac{1}{2}$  inches broad. The stone is medium to large in size, and sharply pointed. Sometimes the bony portion of the stone does not harden, thus giving rise to what are termed seedless fruits. While trees of this variety do not bear as heavily as do those of some other sorts, the fruits have the highest sucrose content of any yet analyzed. An excellent jujube, with shapely fruits which process well.

**22686. ZIZIPHUS JUJUBA.** Lang jujube. From Tsintse, Shansi Province, China. Scions secured by Frank N. Meyer, Agricultural Explorer. Fruits obovoid to pear shaped, sometimes oblique, of large size, sometimes as much as an inch and a half in greatest diameter. The stone is ellipsoid, medium sized, tapering to one end which terminates in a sharp spine. The variety is a heavy bearer, and the fruits have a high sugar content. Undoubtedly one of the best sorts yet tested in the United States.

**38245. ZIZIPHUS JUJUBA.** Sui Men jujube. From Pai Hsiang Chen, Shansi Province, China. Scions secured by Frank N. Meyer, Agricultural Explorer. Fruits ellipsoidal in form, medium sized, up to  $1\frac{3}{4}$  inches in length by  $\frac{1}{2}$  inch in thickness. The stone is medium sized,

tapering toward one end and terminating in a sharp point. The fruit is an excellent one for general purposes, and processes well.

**38249. ZIZIPHUS JUJUBA.** Li jujube. From Fuma, Shansi Province, China. Scions collected by Frank N. Meyer, Agricultural Explorer. The largest variety yet introduced into this country, and somewhat later in ripening than most other sorts. The fruits are round to ovoid in form, and 1½ to 2 inches long. The stone is rather small, ovoid in form, tapering toward one end and terminating in a sharp point. An excellent sort, highly recommended.

**45638. ZIZIPHUS MAURITIANA.** Indian jujube. From India and southern China. Presented by G. Regnard from plants grown in Port Louis, Mauritius Island, Africa. This moderate-sized tree is cultivated in villages of western India and wild in the forests of the Punjab and United Provinces. The leaves are dark green above, woolly below; the spines, if present, are short. The flowers are borne in several-flowered axillary cymes similar to those of *Z. jujuba* except that the flower stalk and calyx are abundantly soft-hairy. The fruit is spherical and generally one inch in diameter with a stone larger in proportion to the flesh than the Chinese jujubes. The fruits are generally quite acid, though by cultivation they are much improved both in size and flavor, resembling crab apples. The ripe fruits are excellent when stewed, and when unripe they may be pickled. The pulp is dried, mixed with salt and tamarinds to form a condiment, or is made into chutnies. The leaves constitute a valuable forage and the bark yields tannic acid. The hard reddish wood is used in ordinary construction work and in furniture making. In the continental United States this species can probably be grown only in southern Florida. It is worthy of trial in tropical America generally and may prove useful in breeding to increase the acidity of the Chinese jujubes; its handsome foliage even renders it attractive as an ornamental.

**44442. ZIZIPHUS MISTOL.** Mistol. From Tucuman, Argentina. Seeds presented by E. F. Schultz, horticulturist, Tucuman Experiment Station. A spiny tree native to Argentina, attaining 30 feet in height with oval leathery hoary-pubescent leaves about 1 inch long, and edible black fruits about one-third of an inch in diameter, with large stones. The wood is red and hard but not known to be of commercial value. As it is not very frost resistant, its cultivation is probably limited to southern Florida and tropical America.

**51741. ZIZIPHUS SPINA-CHRISTI.** From Haifa, Syria. Seeds presented by Amram Khazanoff. A shrub 10 to 17 feet high with whitish, spiny branches, rounded or heart-shaped leaves four-fifths of an inch to 1 3/5 inches long, and roundish, dry, astringent fruits about the size of hazel nuts. This species is much cultivated in the gardens and oases of the Sudan, and is chiefly used as a shrub for shading crops. Its tendency to sucker has rendered it impractical for stock purposes, and it should not be planted in ground upon which it is contemplated to set out other crops, as the eradication of the roots is difficult.

